Imaginary Numbers

Real Numbers & Imaginary

Complex Number

$6 \rightarrow 6 + 0i$

$5i \rightarrow 0 + 5i$

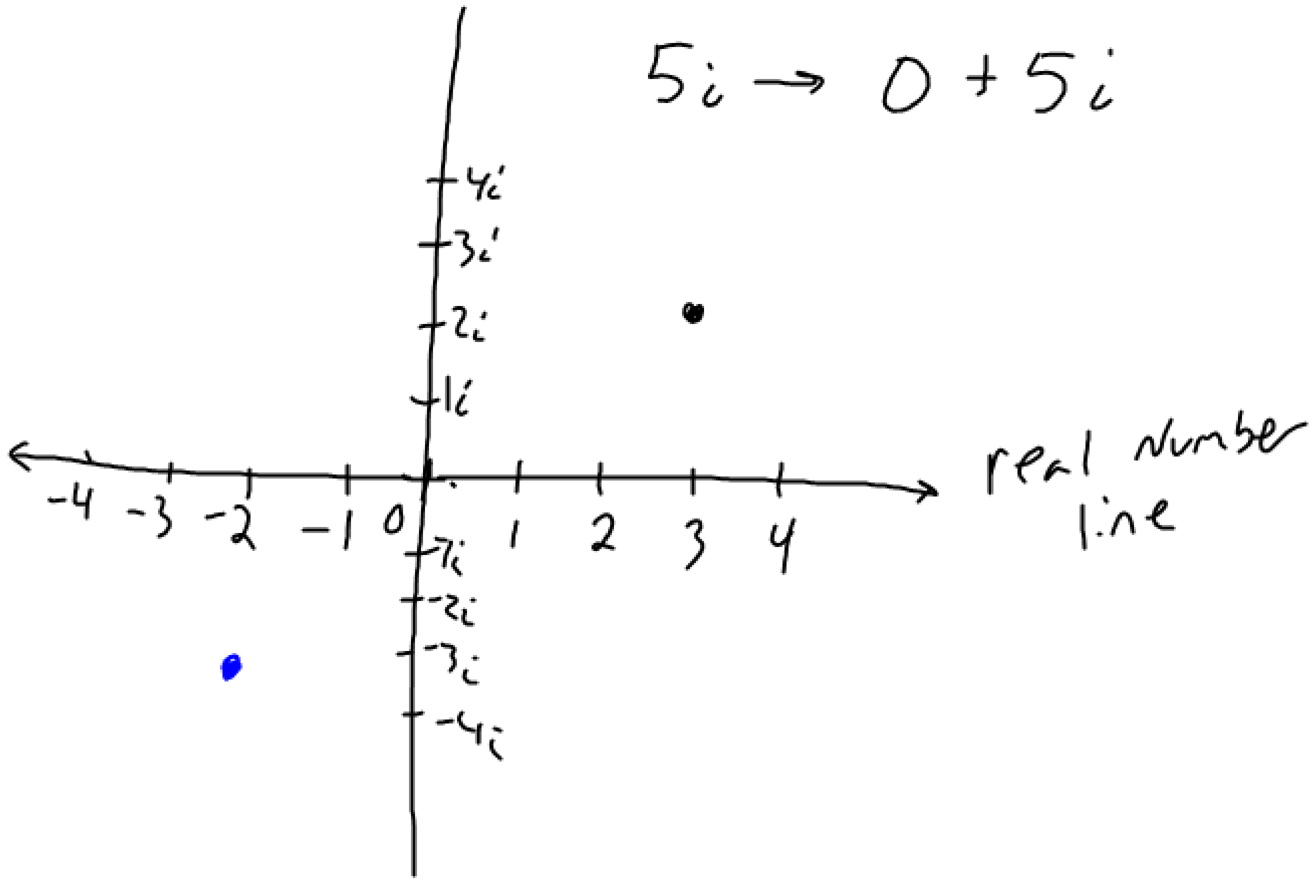
$a + bi$

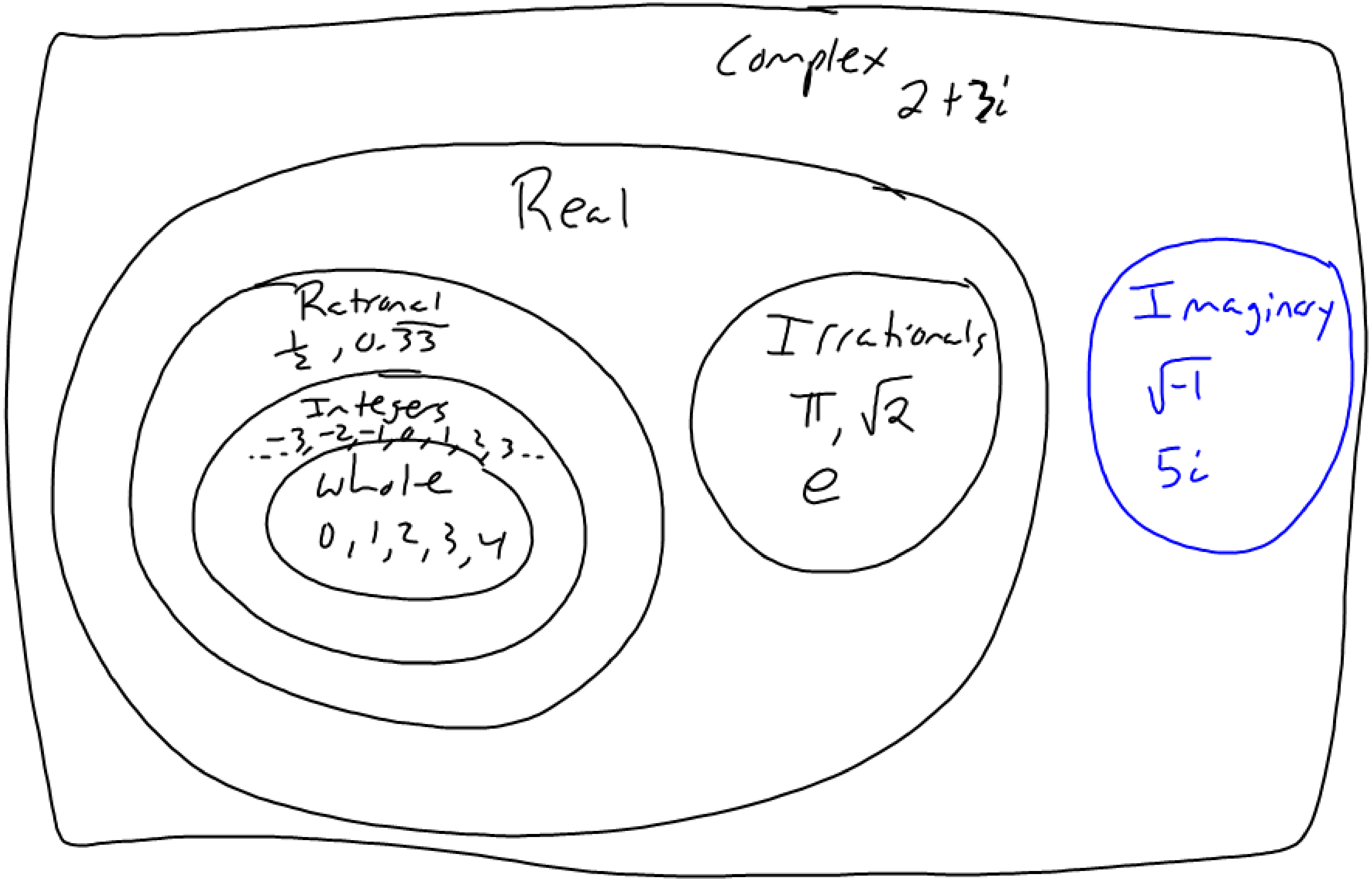
a → real

bi → imaginary part

$3+2i$

$-2-3i$




Complex 2+3i
Real
Rational
½, 0.33
Integers
...-3,-2,-1,0,1,2,3...
Whole
0,1,2,3,4
Irrationals
π, √2
e
Imaginary
√-1
5i

$i = \sqrt{-1}$

$i^2 = -1$

$x^2 + 1 = 0$
$\quad -1 \quad -1$

$x^2 = -1$
$\sqrt{\ } \quad \sqrt{\ }$

$x = \pm\sqrt{-1}$

$x = \pm i$

$\sqrt{-100} = 10i$

$\sqrt{-25} = 5i$

$\sqrt{-7} = \sqrt{7}\, i$

$\sqrt{-8} = 2\sqrt{2}\, i$

Sq. root asks what times itself equals the number in the $\sqrt{\ }$

$\sqrt{4} \rightarrow 2 \cdot 2$
$\qquad -2 \cdot -2$

$$(2+3i)+(4+5i)=6+8i$$

$$(3-2i)-(6+3i)=-3-5i$$

$$6-(3+2i)=3-2i$$

$$(6+0i)-(3+2i)=3-2i$$

$$(3+2i)(4+3i)$$

$$12+9i+8i+6i^2$$

$$12+17i+6i^2$$

$$12+17i+6(-1)$$

$$\boxed{6+17i}$$

$$\frac{\frac{1}{4}}{\frac{2}{3}} \Rightarrow \frac{1}{4} \cdot \frac{3}{2} = \boxed{\frac{3}{8}}$$

$$\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \boxed{\frac{\sqrt{2}}{2}}$$

write in standard form

$$\frac{2+3i}{4-2i}$$

mult. by conjugate of the bottom

$a+bi$

$$\frac{2+3i}{4-2i} \cdot \frac{4+2i}{4+2i} = \frac{8+16i+6i^2}{16-4i^2} = \frac{8+16i-6}{16+4} = \frac{2+16i}{20} = \boxed{\frac{1}{10} + \frac{4}{5}i}$$

Sect. 2.4

#1-4 (vocab), #1-4, 5, 6, 11, 15-17, 25, 26, 29, 30, 31,

34, 37-41, 47, 50, 65, 67-72 (4).